

WHAT IS CLAIMED IS:

1. A microscope for simultaneous observation of an object by a first observer and a second observer, the microscope comprising:

5 a main objective (2) defining an optical axis (2a) and an optical beam path (17) following a direction of the optical axis (2a);

a magnification system (12, 13) mounted after the main objective (2);

10 a beam splitter device (5) mounted after the main objective (2) for deflecting a first partial optical beam path (17a) of the optical beam path (17) into a first plane (I) of the microscope, and for transmitting a second partial optical beam path (17b) of the optical beam path (17) in the direction of the optical axis (2a);

a plurality of deflector elements (6a, 6b) for deflecting the first partial optical beam path (17a) out of the first plane (I) and into a second plane (II) of the microscope extending substantially parallel to the first plane (I); and

15 a further deflector element (6c) for deflecting the second partial optical beam path (17b) transmitted by the beam splitter device (5) into a third plane (III) of the microscope extending substantially parallel to the first and second planes (I, II) and located above the first and second planes (I, II).

- 20 2. The microscope according to claim 1, wherein the beam splitter device (5) is a geometric beam splitter.

3. The microscope according to claim 2, wherein the beam splitter device (5) includes at least one reflective area (42a, 42b) and at least one transmitting area (43a, 43b).

- 25 4. The microscope according to claim 1, wherein the beam splitter device (5) is a physical beam splitter.

5. The microscope according to claim 1, wherein the first, second, and third planes (I, II, and III) of the microscope are substantially horizontal.
6. The microscope according to claim 1, wherein the magnification system (12, 13) includes a first zoom system (12) for the first observer provided in the first plane or the second plane I, II of the microscope, and a second zoom system (13) for the second observer provided in the third plane III of the microscope.
7. The microscope according to claim 6, wherein each of the first and second zoom systems (12, 13) includes at least two magnification or observation channels.
8. The microscope according to claim 1, wherein the further deflector element (6c) is pivotable about the optical axis (2a).
9. The microscope according to claim 1, wherein the first partial optical beam path (17a) and the second partial optical beam path (17b) intersect in a region (20) of the point of intersection of the optical axis (2a) of the main objective and the second plane II of the microscope.
10. The microscope according to claim 1, further comprising a plurality of additional deflector elements (14a, 14b) for deflecting the first partial optical beam path (17a) out of the second plane (II) and into the first plane (I).
11. The microscope according to claim 10, wherein the plurality of additional deflector elements are selectively pivotable to enable adjustment of a viewing angle associated with the first partial optical beam path (17a).
12. The microscope according to claim 1, further comprising a data projection device (21) between the main objective (2) and the beam splitter device (5).

13. The microscope according to claim 1, further comprising optical accessories and/or intermediate imaging systems (11, 15) arranged along the first partial optical beam path (17a)..
14. The microscope according to claim 1, further comprising an illuminating device (4) for illuminating the object.
15. The microscope according to claim 6, wherein the first zoom system (12) and the second zoom system (13) are electrically and/or mechanical coupled to one another.